Space Weather Forecast

Issued on Tuesday 18 March 2025 at 13:13 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate class flares likely. Chance of G1/Minor Storms days 2-4 due to coronal mass ejection arrivals.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with a peak flare at 17/1933 UTC associated with a filament eruption in the northeast.

There are fourteen regions on the visible disc. In the northwest is the largest spot at present, with recent growth observed in it's trailing portion. The region in the southeast is of similar size, with slight proliferation of intermediate spots. Another region in the north near centre disk continues to show minor growth. None of the above spots are showing any significant magnetic complexity, with the remainder of the spots, smaller and apparently stable.

Several coronal mass ejections (CMEs) were observed leaving the Sun during 17 Mar, this gives a chance for CMEs to affect Earth on day 2 to 4.

Solar Wind / Geomagnetic Activity: Solar winds were at slow to slightly elevated levels (around 400 km/s). The Magnetic Field was weak, with the north-south component also weak and variable. Geomagnetic activity was at Quiet to Unsettled levels.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected, with an ongoing chance of isolated Moderate flares.

Solar Wind / Geomagnetic Activity: There are three main coronal mass ejections which feature in the forecast, the first is from a filament eruption which occurred in the northeast quadrant at 16/2020 UTC, possibly arriving late 19 Mar. The second coronal mass ejection was from a filament eruption in the northwest around 17/1030UTC, with ejecta clearly leaving to the west, though a faint halo can be seen later on StereoA imagery, possibly arriving 20 Mar. The third coronal mass ejection was associated with the 17/1930UTC moderate class flare and filament eruption perhaps arriving early on 21 Mar.

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Solar winds are likely to remain mostly at slow levels with slightly elevated or elevated enhancements probable due to CME arrivals.

Quiet to Unsettled activity with a chance of G1-G2/Minor-Moderate storms days 2-4 (19-21 Mar) should any of the three possible coronal mass ejections arrive and/or combine.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background levels, with a slight chance of enhancement should there be any larger flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	No	5	40	30	30
Strong	**G3**	No	1	1	1	1
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**R1-R2 (M Class)**	Yes	40	40	30	40
Very Active	**R3-R5 (X Class)**	No	5	5	5	5

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	5	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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